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INTRA-ATOLL RESIGHTINGS OF THE HAWAIIAN MONK SEAL

MONACHUS SCHAUINSLANDI

AT

FRENCH FRIGATE SHOALS

1 JANUARY 1983 - 31 AUGUST 1983

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PREFACE

This report was prepared under contract No. 41 USC 252 (C) (3) to the National Marine Fisheries Service by Gale W. Fairaizl. The primary purpose of the contract was to continue monitoring movements and reproductive patterns of individually identifiable Hawaiian monk seals at French Frigate Shoals. The statements and findings in this report are those of the contractor and do not necessarily reflect the view of the National Marine Fisheries Service.

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INTRODUCTION

A large breeding population of the endangered Hawaiian monk seal, Monachus schauinslandi, is found at French Frigate Shoals (FFS). FFS is a crescent shaped atoll which lies midway in the Hawaiian archipelago and is located at lat. 23 45'N, long. 166 10'W. FFS, which consists of a large volcanic pinnacle and 12 small sandy islets, was designated a breeding bird preserve by President Theodore Roosevelt in 1909 and became part of the Hawaiian Islands National Wildlife Refuge (HINWR) in 1940.

FFS was initially inhabited during WWII by the Navy who enlarged one of the islets, Tern Island, from 11-37 acres to accomodate an air-strip. The Coast Guard established a LORAN Station on East Island in 1944 and moved to Tern Island in 1952 where the station was maintained until 1979. The station was decommissioned in July 1979 and two U.S. Fish & Wildlife Service (FWS) refuge managers and their spouses replaced the 20 Coast Guard personnel. FWS acquired Tern Island for the purpose of performing research and assisting other agencies in research projects while agreeing to maintain the facilities.

A long term research project on the Hawaiian monk seal was initiated at FFS in July of 1979. The purpose of this report is to present and summarize the sightings of intraatoll movements of individually identified monk seals from the period of 1 January 1983 to 31 August 1983.

METHODS

Sightings of intraatoll movements of individually identified Hawaiian

monk seals were recorded on data sheets. Seals were individually identified by obvious natural bleach marks or scars. A seal was considered individually identified or "known" by the presence of a bleach mark or scar(s) that were obvious to all observers or by a rear flipper tag.

Known seals were assigned an identification number (I.D.#) and photographs of those identifying marks were taken. An attempt was made to photograph the seals' ventral, dorsal, left and right sides as these help to further identify and confirm sightings of individual seals. The photographs were subsequently placed in photo albums that were categorized by age and sex. The photographs were updated opportunistically to document fresh wounds or any other physical change. Sketches or "scar cards" were often drawn up to further aid in identification.

Individual files were established for all seals with I.D.#'s where the date, age, island, sector, molt, association, behavior and pup status were recorded for each resighting as well as any other incidental observations.

Deceased known seals and known seals without recent resightings and good photographs for identification were placed in inactive files. Their I.D.#'s were not reassigned to avoid confusing their histories with those of other seals. Known seals which have good recognizable marks but no recent sightings were kept in the active files.

Data on the intraatoll movements of the monk seal were collected from a 4 day interval seal survey on Tern Island and a 36 day interval atoll survey using the techniques reported by Ittner, 1982. As a result, Tern was surveyed more frequently and the seals received closer scrutiny than the seals on outer islets. A new survey form was introduced by

National Marine Fisheries Service (NMFS) on 17 April 1983 which required additional information on age classes and behavior. Additional data on intraatoll movements were collected by the NMFS field camps that were set up on East and Whale-Skate Islands from May to mid-August, 1983. The primary objective of these field camps was to collect pupping data on adult female seals and identify mother-pup pairs.

RESULTS AND DISCUSSION

Upon completion of this study, there were a total of 253 known seals at FFS. There were 83 adult males (AM), 108 adult females (AF), 15 subadult males (SM), 17 subadult females (SF), 13 juvenile males (JM), 15 juvenile females (JF), and 3 seals of unknown age and sex.

Twenty seals were added to the active files during this study period (Table 1).

Table 1. Seals Added To The Active Files.

	AM	AF	SM	SF	JM	JF
I.D.#	254	253	267	265	125	-
	256	255	-	268	258	-
	263	257	-	-	-	-
	270	260	-	-	-	-
	-	261	-	-	-	-
	-	262	-	-	-	-
	-	264	-	-	-	-
	-	266	-	-	-	-
	-	269	-	-	-	-
	-	271	-	-	-	-
	-	272	-	-	-	-

Eighteen seals were placed in inactive files (Table 2).

Table 2. Known Seals Placed In The Inactive Files.

	AM	AF	A?[1]	SM	SF	S?	JM	JF	J?	P[2]
I.D.#	204	202	163	-	-	124	187	189	68	12
	105	85	-	-	-	-	98	174	-	-
	-	35	-	-	-	-	-	80*	-	-
	-	198	-	-	-	-	-	-	-	-
	-	236	-	-	-	-	-	-	-	-
	-	155	-	-	-	-	-	-	-	-
	-	21	-	-	-	-	-	-	-	-

1 unknown sex
2 pup
* deceased

Twenty seals were kept in the active files but have not been re-sighted for the past 1 to 3 years (Table 3).

Table 3. Seals Kept in the Active Files but no Recent Resightings.

	AM	AF	A?	SM	SF	S?	JM	JF	J?
I.D.#	194	176	-	95	51	167	-	126	93
	179	66	-	-	-	166	-	117	-
	193	113	-	-	-	-	-	92	-
	192	197	-	-	-	-	-	-	-
	127	123	-	-	-	-	-	-	-
	-	90	-	-	-	-	-	-	-

Close scrutiny of the active files revealed the presence of several duplicates. As a result 8 AF's were combined into 4 (Table 4).

Table 4. Duplicate I.D.#'s Combined.

AF	I.D.#185	and AF	I.D.#198
	59		236
	67		155
	34		21

I.D.#'s 198, 236, 155, and 21 were removed from the active files.

INTRAATOLL RESIGHTINGS OF KNOWN SEALS AT FFS

Known seals were resighted on all of the islets in FFS during this study with the exception of Gin, Little Gin and Bare Islands (Tables 5, 6, 7, 8, 9, 10). The two Gins were rarely surveyed because of their distance from Tern, and Bare must be surveyed from offshore in a boat as embarking on the island would create too much disturbance.

Table 5. Intraatoll Sightings of Known Adult Males at FFS.

AM I.D.#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
2	*	–	–	–	–	–	–	–	–	–
6	*	–	–	–	–	–	–	–	–	–
20	*	–	–	–	–	–	–	–	–	–
23	*	–	–	–	–	–	–	–	–	–
28	*	–	–	–	–	–	–	–	–	–
31	*	–	–	–	–	–	*	–	–	–
32	*	–	–	–	–	–	–	–	–	–
36	*	–	–	–	–	–	–	–	–	–
37	*	–	–	–	–	–	–	–	–	–
38	*	–	–	–	–	–	–	–	–	–
40	*	–	–	–	–	–	–	–	–	–
42	*	–	–	–	–	–	–	–	–	–
43	–	–	–	*	–	–	–	–	–	–
44	*	–	–	*	–	–	–	–	–	–
50	*	–	–	–	–	–	–	–	–	–
52	*	–	–	–	–	–	–	–	–	–
58	*	–	–	–	–	–	–	–	–	–
71	*	–	–	–	–	–	–	–	–	–
74	*	–	–	–	–	–	–	–	–	–
76	*	–	–	–	–	–	–	–	–	–
77	*	–	–	–	–	–	–	–	–	–
82	*	–	–	–	–	–	–	–	–	–
88	*	–	–	–	–	–	–	–	–	–
89	*	–	–	*	–	–	–	–	–	–
96	*	–	–	–	–	–	–	–	–	–
99	*	–	–	–	–	–	–	–	–	–
102	*	–	–	–	–	–	–	–	–	–
106	*	–	–	–	–	–	–	–	–	–
108	*	–	*	–	–	–	–	–	–	–
111	*	–	–	–	–	–	–	–	–	–
114	*	–	–	–	–	–	–	–	–	–
115	–	*	–	–	–	–	–	–	–	–
116	*	–	–	*	–	–	–	*	–	–
120	*	–	–	–	–	–	–	–	–	–

Table 5 con't.

AM I.D#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
121	*	-	-	-	-	-	-	-	-	-
129	*	-	-	-	-	-	-	-	-	-
130	*	-	-	-	-	-	-	-	-	-
131	*	-	-	-	-	-	-	-	-	-
133	*	-	-	-	-	-	-	-	-	-
134	*	-	-	-	-	-	-	-	-	-
136	*	-	-	-	-	-	-	-	-	-
139	*	-	-	-	-	-	-	-	-	-
142	*	-	-	-	-	-	-	-	-	-
143	*	-	-	-	-	-	-	-	-	-
153	*	-	-	-	-	-	-	-	-	-
161	*	-	-	-	-	-	-	-	-	-
165	*	-	-	-	-	-	-	-	-	-
168	*	*	-	-	-	-	-	-	-	-
183	-	-	-	*	-	-	-	-	-	-
184	-	-	-	*	-	-	-	-	-	-
188	*	-	-	-	-	-	-	-	-	-
191	*	-	-	-	-	-	-	-	-	-
196	?	-	-	-	-	-	-	-	-	-
215	*	-	-	*	-	-	-	-	-	-
219	*	-	-	-	-	-	-	-	-	-
242	*	-	-	*	-	-	-	-	-	-
249	*	-	-	-	-	-	-	-	-	-
250	*	-	-	-	-	-	-	-	-	-
254	*	-	-	*	-	-	-	-	-	-
256	*	-	-	-	-	-	-	-	-	-
258	*	-	-	-	-	-	*	-	-	-
259	*	-	-	-	-	-	-	-	-	-
263	-	-	*	-	-	-	-	-	-	-
270	*	-	*	-	-	-	-	-	-	-

Table 6. Intraatoll Sightings of Known Adult Females in FFS

AF I.D.#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
4	*	*	*	-	-	-	-	-	-	-
8	-	-	*	-	-	-	-	-	-	-
9	*	-	*	-	-	-	-	-	-	-
10	*	-	*	*	-	-	-	-	-	-
11	-	-	-	*	-	-	-	-	-	-
14	*	-	*	-	-	-	-	-	-	-
19	*	-	-	-	-	-	-	-	-	-
26	*	-	-	-	-	-	-	-	-	-
27	*	-	-	-	-	-	-	-	-	-
29	*	-	*	-	-	-	-	-	-	-
33	*	-	-	-	-	-	-	-	-	-
46	*	-	*	-	-	-	-	-	-	-

Table 6 con't.

AF I.D#	Tern	Trig	Fast	WS	RO	MU	Shark	Dis	Gins	Bare
56	*	-	*	*	-	-	-	-	-	-
59	-	-	-	*	-	-	-	-	-	-
63	*	-	*	-	-	-	-	-	-	-
65	-	-	-	*	-	-	-	-	-	-
67	-	-	-	*	-	-	-	-	-	-
69	*	-	-	-	-	-	-	-	-	-
70	*	-	*	-	-	-	-	-	-	-
72	*	-	-	*	-	-	-	-	-	-
78	*	-	-	-	-	*	-	-	-	-
84	-	-	-	*	-	-	-	-	-	-
87	-	-	-	?	-	-	-	-	-	-
94	*	-	-	*	-	-	-	-	-	-
103	*	-	-	*	-	-	-	-	-	-
107	*	-	-	-	-	-	-	-	-	-
110	*	-	-	-	-	-	-	-	-	-
128	*	*	-	*	-	-	-	-	-	-
135	-	-	*	*	-	-	-	-	-	-
140	*	-	-	-	-	-	-	-	-	-
144	?	-	-	-	-	-	-	-	-	-
145	*	-	-	-	-	-	-	-	-	-
149	-	-	*	-	-	-	-	-	-	-
150	*	-	-	*	-	-	-	-	-	-
159	*	-	-	-	-	-	-	-	-	-
164	-	-	*	-	-	-	-	-	-	-
171	-	-	-	*	-	-	-	-	-	-
173	-	-	*	-	-	-	-	-	-	-
178	*	-	-	-	-	-	-	-	-	-
180	*	-	*	-	-	-	-	-	-	-
190	-	-	-	*	-	-	-	-	-	-
199	-	-	-	*	-	-	-	-	-	-
203	-	-	*	-	-	-	-	-	-	-
206	-	-	-	*	-	-	-	-	-	-
209	-	-	*	-	-	-	-	-	-	-
210	-	-	*	-	-	-	-	-	-	-
212	-	-	*	-	-	-	-	-	-	-
218	-	-	*	-	-	-	-	-	-	-
220	-	-	*	-	-	-	-	-	-	-
221	-	-	*	-	-	-	-	-	-	-
223	*	-	*	-	-	-	-	-	-	-
226	-	-	-	*	-	-	-	-	-	-
227	*	-	-	*	-	-	-	-	-	-
228	-	*	-	*	*	-	-	-	-	-
232	-	-	-	*	-	-	-	-	-	-
233	-	-	?	-	-	-	-	-	-	-
234	*	-	-	-	-	-	-	-	-	-
235	-	-	-	*	-	-	-	-	-	-
243	-	-	-	?	-	-	-	-	-	-
251	-	-	-	*	-	-	-	-	-	-

Table 6 con't.

AF I.D.#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
253	*	-	-	-	-	-	-	-	-	-
255	-	-	*	-	-	-	-	-	-	-
257	-	-	-	*	-	-	-	-	-	-
260	-	*	*	-	-	-	-	-	-	-
261	-	-	-	*	-	-	-	-	-	-
262	-	-	*	-	-	-	-	*	-	-
264	-	-	*	-	-	-	-	-	-	-
266	-	-	*	*	-	-	-	-	-	-
269	*	*	-	-	-	-	-	-	-	-
271	-	*	*	-	-	-	-	-	-	-
272	*	-	-	-	-	-	-	-	-	-

Table 7. Intraatoll Sightings of Known Subadult Males in FFS.

SM I.D.#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
25	*	-	-	-	-	-	-	-	-	-
47	*	-	-	-	-	-	-	-	-	-
48	*	-	-	-	-	-	-	-	-	-
62	*	-	-	-	-	-	-	-	-	-
76	*	-	-	-	-	-	-	-	-	-
141	*	-	-	-	-	-	-	-	-	-
158	*	-	-	*	-	-	*	-	-	-
170	*	-	-	-	-	-	-	-	-	-
238	*	-	-	-	-	-	-	-	-	-
267	-	*	-	*	-	-	-	-	-	-

Table 8. Intraatoll Sightings of Known Subadult Females in FFS

SF I.D.#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
22	?	-	-	-	-	-	-	-	-	-
30	*	-	-	-	-	-	-	-	-	-
49	*	-	*	-	-	-	-	-	-	-
55	*	-	-	-	-	-	-	-	-	-
61	*	-	-	-	-	-	-	-	-	-
132	*	-	-	-	-	-	-	-	-	-
146	-	*	-	-	-	-	-	-	-	-
162	*	-	*	*	-	-	-	-	-	-
244	-	-	*	-	-	-	-	-	-	-
248	-	-	*	?	-	-	-	-	-	-
265	-	-	*	-	-	-	-	-	-	-
268	*	-	-	-	-	-	-	-	-	-

Table 9. Intraatoll Sightings of Known Juvenile Males in FFS.

JM I.D.#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
18	*	-	-	-	-	-	-	-	-	-

Table 9 cont.

JM I.D.#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
45	*	-	*	-	-	-	-	-	-	-
86	-	-	-	*	-	-	-	-	-	-
112	*	-	-	*	-	-	-	-	-	-
125	*	-	-	-	-	-	-	-	-	-

Table 10. Intraatoll Sightings of Known Juvenile Females in FFS

JF I.D.#	Tern	Trig	East	WS	RO	MU	Shark	Dis	Gins	Bare
101	*	-	*	-	-	-	-	-	-	-
147	*	-	-	-	-	-	-	-	-	-
181	*	-	*	-	-	-	-	-	-	-
211	*	-	-	-	-	-	-	-	-	-
252	*	-	-	-	-	-	-	-	-	-

?=not a confirmed sighting

Nearly twice as many known AM's were resighted on Tern than known AF's (Table 11). This may be explained by the fact that AM's tend to "cruise" around all islands, and AF's spend more time on other islands during pupping season.

Table 11. Resightings of Known Seals in FFS.

	Total # of Known Seals	# Known Seals Resighted on Tern	# Known Seals Re-sighted on Other Islands	% Resightings Known Seals FFS
AM	83	57	5	75
AF	107	33	37	65
SM	15	9	1	66
SF	17	7	4	65
JM	13	4	1	38
JF	15	5	0	33

RESIGHTINGS OF TAGGED SEALS

Approximately 305 seal pups were tagged in the folds of their rear flippers between the years of 1966 and 1972 at FFS (Peiterson, pers. comm.) (Table 12).

Table 12. Tagging at French Frigate Shoals

Number Tagged at FFS	Year
10	1966
46	1967
68	1968
47	1969
54	1970
41	1971
39	1972
305	

Eleven tagged seals were resighted on 35 different occasions from July 1979 through December 1981 (Schulmeister 1982) and 12 tagged seals were resighted 67 times from 1 January to December 1982 (Ittner 1982). A total of 13 tagged seals, 6 AM's and 7 AF's,were resighted on 41 different occasions during this study period. Four of the tagged AF's, I.D.#'s59, 150, 171 and 218, pupped this year. Resightings of tagged AF's with nursing pups were recorded only once during the 1983 pupping season, as daily recordings would have artificially inflated the number of tagged seals (Table 13).

Table 13. Resightings of Tagged Seals.

Sex & I.D.#	Age	Year Tagged	Island Tagged	Tag No.	Island-Resighting	
AF#59	11	1972	Tern	A500	WS	4 June
						12 June
						7 July
						21 Aug.
AF#150	11	1972	Whale Skate	A1094	TE	16 Mar
						17 Mar
						24 Mar
						25 Apr
						27 Apr
						16 June
					WS	18 Jul

Table 13 con't.

Sex & I.D.#	Age	Year Tagged	Island Tagged	Tag No.	Island-Resighting	
AF#159	16	1967	Trig	A8	TE	31 Jan
					WS	19 Jun
					TE	22 Aug
AF#171	14	1969	Whale Skate	A796	WS	6 Jun
AF#173	13	1970	Round	A763	EA	18 May
						12 Jun
						16 Jul
AF#206	13	1970	Round	A757	WS	15 May
						17 Jun
					EA	10 Jul
					WS	22 Jul
AF#218	12	1971	East	A954	EA	8 Jun
AM#108	14	1969	East	A786	TE	20 Jan
						21 Jan
						21 Feb
						24 Feb
					EA	9 Apr
					TE	1 May
					EA	9 May
AM#129	13	1970	Round	A760	TE	20 May
						29 May
						31 May
AM#165	13	1970	Round	A768	TE	8 Feb
AM#184	13	1970	Whale Skate	A923	WS	6 Jul
AM#183	13	1970	Whale Skate	A912	WS	8 Jun
						15 Jun
						6 Jul
AM#249	12	1971	Shark	A986	TE	27 Jan
						16 Feb
						16 Mar

The highest number of resightings were on Tern Island with AF I.D.# 150 and AM I.D.#108 comprising 58%. Tern was surveyed more frequently which probably explains the higher number of resightings. Tagged seals that were resighted from July 1979 through December 1981 were resighted during this study with the exception of AM I.D.#172, tag no. A788 and AF I.D.#182, tag no. A902. Tagged seals that were sighted in 1982 were re-

sighted during this study with the exception of AF I.D.#214, tag no. A-1043. AM I.D.#129, tag no. A760, was resighted for the first time since 23 July 1980 on Tern Island.

The loss of tags through natural circumstances, the difficulty of seeing the tags and the absence of major scars on tagged seals may help explain the low number of resightings. AF I.D.#'s 59, 171, 218 (who obtained her scar in June 1983) and AM I.D.#108 were the only tagged seals, sighted during this study, which had easily recognizable scars. AM I.D.#165 had no photographs to help in identification and the remaining seals, AF I.D.#'s 150, 159, 173, 206 and AM I.D.#'s 41, 129 and 183 had obscure scars that made identification and confirmation of resightings difficult.

Sector Preference of Known Seals on Tern

The sector preference of known seals which hauled out on Tern Island during this study is shown in Tables 14, 15 and 16.

Table 14. Sector Preference of Known Adult Males on Tern Island.

AM I.D.#	# of Sectors Used	# of Sightings	# of Sightings in Each Sector 1	2	3	4	5	6	7	8	9	10
2	4	9	2	1	*	2	4	*	*	*	*	*
6	4	8	*	3	*	1	3	1	*	*	*	*
20	5	7	1	1	*	4	1	*	*	*	*	*
23	3	5	*	*	3	1	*	1	*	*	*	*
28	5	14	1	1	1	*	*	*	*	5	6	*
31	5	10	1	3	1	2	2	*	*	*	*	*
32	3	7	*	*	3	2	2	*	*	*	*	*
36	2	3	*	2	*	1	*	*	*	*	*	*
37	3	3	*	1	1	1	*	*	*	*	*	*
38	4	23	5	14	1	3	*	*	*	*	*	*
40	4	4	*	1	1	1	*	1	*	*	*	*
42	3	14	*	3	1	7	1	2	*	*	*	*
44	2	16	*	*	5	11	*	*	*	*	*	*
50	2	4	*	*	1	*	*	4	*	*	*	*
52	4	5	*	1	1	*	1	2	*	*	*	*

Table 14 con't.

AM I.D.#	# of Sectors Used	# Of Sightings	# of Sightings in Each Sector 1	2	3	4	5	6	7	8	9	10
58	4	9	1	*	3	3	*	1	*	*	*	*
71	1	2	*	*	*	*	2	*	*	*	*	*
74	1	1	*	*	*	*	*	*	*	1	*	*
77	6	12	1	4	1	4	1	1	*	*	*	*
82	4	7	*	4	1	1	1	*	*	*	*	*
88	5	10	*	1	1	5	2	1	*	*	*	*
89	3	9	1	6	2	*	*	*	*	*	*	*
96	5	9	*	2	*	1	2	1	*	*	*	*
99	3	5	*	1	3	1	*	*	*	*	*	*
102	3	7	*	1	2	4	*	*	*	*	*	*
106	3	11	*	*	3	6	2	*	*	*	*	*
108	2	5	*	4	*	1	*	*	*	1	*	*
111	2	11	2	8	*	*	*	*	*	*	*	*
114	3	4	1	*	2	1	*	*	*	*	*	*
116	1	1	*	1	*	*	*	*	*	*	*	*
121	2	3	*	2	*	*	1	*	*	*	*	*
129	1	3	*	3	*	*	*	*	*	*	*	*
130	2	4	*	2	*	*	2	*	*	*	*	*
131	3	17	*	13	3	*	1	*	*	*	*	*
134	3	5	*	*	2	2	*	2	*	*	*	*
136	2	4	*	*	*	*	1	3	*	*	*	*
142	2	3	*	*	2	1	*	*	*	*	*	*
143	4	8	1	*	4	2	*	1	*	*	*	*
153	6	7	1	1	1	2	1	1	*	*	*	*
161	3	10	*	5	3	*	*	1	*	*	*	*
165	1	1	*	1	*	*	*	*	*	*	*	*
168	4	13	6	3	2	1	*	*	*	*	*	*
188	1	1	*	*	1	*	*	*	*	*	*	*
191	4	6	*	1	1	1	1	2	*	*	*	*
215	3	8	*	5	2	*	*	1	*	*	*	*
219	2	2	*	1	*	1	*	*	*	*	*	*
242	1	2	*	*	*	*	1	*	*	*	*	*
249	1	3	*	*	3	*	*	*	*	*	*	*
250	3	9	*	6	*	1	1	*	*	*	*	*
254	2	5	*	4	*	*	*	1	*	*	*	*
259	1	4	*	4	*	*	*	*	*	*	*	*
270	1	1	*	*	*	1	*	*	*	*	*	*
		Totals:	23	114	61	76	32	27	0	7	6	0

Table 15. Sector Preference of Known Adult Females on Tern Island.

AF I.D.#	# of Sectors Used	# of Sightings	# of Sightings in Each Sector 1	2	3	4	5	6	7	8	9	10
4	2	3	*	*	*	1	*	2	*	*	*	*
9	3	10	3	6	*	*	1	*	*	*	*	*
10	3	5	1	4	*	*	*	1	*	*	*	*
14	4	13	*	6	4	1	2	*	*	*	*	*
26	5	13	9	*	1	1	1	1	*	*	*	*
27	2	21	13	8	*	*	*	*	*	*	*	*
29	2	4	*	*	3	1	*	*	*	*	*	*
33	4	12	4	3	*	*	4	*	*	*	*	*
56	4	8	3	*	1	*	1	3	*	*	*	*
63	5	20	*	13	3	3	1	*	1	*	*	*
69	1	3	*	*	*	*	*	3	*	*	*	*
70	1	1	*	1	*	*	*	*	*	*	*	*
72	4	25	*	*	9	9	2	5	*	*	*	*
78	2	3	*	*	2	1	*	*	*	*	*	*
94	4	10	3	*	*	4	1	*	*	*	2	*
103	3	4	*	1	2	1	*	*	*	*	*	*
107	4	13	*	1	10	*	1	1	*	*	*	*
110	2	13	6	7	*	*	*	*	*	*	*	*
128	3	6	*	2	*	*	2	1	*	*	*	*
144	2	7	*	*	1	6	*	*	*	*	*	*
145	2	12	*	*	2	8	2	*	*	*	*	*
150	1	6	*	*	*	*	6	*	*	*	*	*
159	2	2	*	*	*	1	1	*	*	*	*	*
178	3	10	*	*	*	4	2	4	*	*	*	*
180	3	7	*	*	3	2	2	*	*	*	*	*
201	1	1?	*	*	*	1	*	*	*	*	*	*
223	1	2	*	*	*	*	*	2	*	*	*	*
227	2	3	*	*	*	*	1	2	*	*	*	*
234	1	1	*	*	*	1	*	*	*	*	*	*
253	2	6	*	4	*	2	*	*	*	*	*	*
257	2	1	*	*	*	*	*	2	*	*	*	*
269	1	1	*	*	*	*	*	1	*	*	*	*
272	1	4	*	*	*	*	*	4	*	*	*	*
		Totals:	41	56	36	47	28	32	1	0	2	0

?=unconfirmed sighting

Table 16. Sector Preference of Known SM's, SF's, JM's JF's on Tern.

SM I.D.#												
47	4	8	*	3	2	2	1	*	*	*	*	*
48	3	11	*	3	6	2	*	*	*	*	*	*
76	2	3	*	1	2	*	*	*	*	*	*	*

Table 16 con't.

SM I.D.#	# of Sectors Used	# of Sightings	# of Sightings in Each Sector 1	2	3	4	5	6	7	8	9	10
133	2	3	*	*	1	2	*	*	*	*	*	*
141	4	16	13	1	1	*	*	1	*	*	*	*
158	3	5	2	*	*	*	*	1	2	*	*	*
170	4	7	2	1	2	1	*	1	*	*	*	*
238	3	9	*	*	1	5	2	*	*	*	*	*
		Totals	17	9	15	12	3	3	2	0	0	0
SF I.D.#												
30	3	9	2	6	*	1	*	*	*	*	*	*
55	4	16	1	10	*	*	1	4	*	*	*	*
61	2	7	*	2	5	*	*	*	*	*	*	*
132	1	3	*	3	*	*	*	*	*	*	*	*
147	4	11	*	2	7	2	*	1	*	*	*	*
162	4	9	2	3	1	1	2	*	*	*	*	*
268	1	4	4	*	*	*	*	*	*	*	*	*
		Totals:	9	26	13	4	3	5	0	0	0	0
JM I.D.#												
18	2	3	2	1	*	*	*	*	*	*	*	*
45	1	6	6	*	*	*	*	*	*	*	*	*
62	5	7	1	2	1	2	*	*	1	*	*	*
76	2	3	1	2	*	*	*	*	*	*	*	*
112	2	2	*	*	1	*	1	*	*	*	*	*
		Totals:	10	5	2	2	1	0	1	0	0	0
JF I.D.#												
101	5	6	1	1	2	1	1	*	*	*	*	*
181	1	1	*	1	*	*	*	*	*	*	*	*
211	2	3	*	2	*	*	*	1	*	*	*	*
252	3	4	1	2	*	*	1	*	*	*	*	*
		Totals:	2	6	2	1	2	1	0	0	0	0

Known AM's were resighted in all of the sectors except for 7 and 10. The highest number of resightings for hauled out known AM's was in sector 2, followed by sectors 4, 3, 5, 6, 1, 8 and 9. Known AF's were resighted in all of the sectors except 8 and 10 with the highest number of resightings in sector 2,followed by 4, 1, 3, 6, 5, 9 and 7. Known AM's and AF's both preferred to haul out in sectors 2 and 4.

The Tern Island photo files contain a small sample, 24, of subadults

and juveniles. These immatures preferred to haul out on the south side of Tern, in sectors 1-6. There were no sightings of known immature seals, excluding weaners, in sectors 8, 9 and 10.

Sector utilization by known AM's and AF's is summarized in Table 17. Data showed that 32% of the AM's utilized at least 3 sectors and 31% of the AF's utilized at least 2 sectors. Sector utilization for known immature seals was not computed because of the small sample size.

Table 17. Summary of Sector Use by Known AM's and AF's.

# Known AM's	# of Sectors Utilized	% of Utilization
9	1	17
11	2	21
17	3	32
9	4	17
4	5	7
2	6	3
0	7-10	0

# Known AF's	# of Sectors Utilized	% of Utilization
9	1	28
10	2	31
6	3	18
5	4	15
2	5	6
0	6-10	0

Sightings of Bleach Marked Weaners on Tern Island

The first artificially bleach marked weaner, this year's weaned pup, was sighted in sector 8 on 30 May 1983. There were 25 resightings of weaners since that date during the 4 day surveys; 18 were resighted in sectors 7, 8, 9, and 10; 4 in sector 1; 2 in sector 6; and 1 in sector 2. Though this was a small sample size it does appear that the weaners hauled out on either the north side or extreme west ends of Tern Island.

This trend needs to be looked at more carefully. Sectors 7, 8, 9, and 10 were seldom used by any other age group (Table 18).

Table 18. Resightings of Bleach Marked Weaners on Tern Island.

Bleach Mark	Sex	Resight Date	Sector
BA	M	30 May	8
BA	M	8 June	10
BA	M	12 June	10
BA	M	24 June	8
BA	M	2 July	10
BE	F	6 July	8
BF	F	10 July	9
BF	F	14 July	6
BM	F	14 July	8
BW	M	18 July	9
BP	M	18 July	9
GH	F	18 July	2
BW	M	22 July	10
BW	M	26 July	1
EK	F	26 July	1
BW	M	3 August	1
RG	F	3 August	6
EN	M	7 August	10
EG	M	15 August	8
BX	M	15 August	8
BV	F	15 August	9
EJ	F	23 August	7
BA	M	27 August	1
EE	M	27 August	8
GS	M	31 August	9

Known Molting Seals on Tern

There were 9 known seals who either partially or completely molted on Tern Island during this study period. The molt intervals in Table 19 are misleading as the % molt was recorded only every 4th day. The first known seal to completely molt was AF I.D.#145. AF I.D.#14 molted on Tern for the 4th consecutive year and AF I.D.#144 molted on Tern for the 3rd consecutive year in sector 4. AF I.D.#33 molted on Tern for the 2nd consecutive year (Table 19).

Table 19. Known Seals Which Molted On Tern From 1 January 1983-31 August 1983.

		1980	1981	1982	1983
AF#14	Molt Date	19-29 June	29 May-?	8-19 July	26 July-12 Aug
	Island	Tern	Tern	Tern	Tern
	Sector(s)	3	2 and 5	3 and 4	3, 4, and5
AF#33	Molt Date			25Aug-8Sept	20June-5 Jul
	Island			Tern	Tern
	Sector(s)			1 and 2	5
SF#61	Molt Date				10-22 July
	Island				Tern
	Sector(s)				3 and 4
AF#144	Molt Date		May	21May-5Jun	1-20 Jun
	Island		Tern	Tern	Tern
	Sector(s)		4	4	4
AF#145	Molt Date			17May-8Jun	19May-8Jun
	Island			Tern	Tern
	Sector(s)			6	4

Sightings of monk seals on Tern Island were rare prior to 1979. Tern apparently became an attractive molting island to several known AF's after that date. The examples cited suggest that these known AF's have established a preferred island to molt on and in the case of AF I.D.#144, a sector preference.

One known AF, 2 known SF's, and 1 known SM partially molted on Tern during this study (Table 20).

Table 20. Molt Intervals of Known Seals Who Partially Molted on Tern.

		MAY	JUNE	JULY	AUGUST
SM I.D.# 48	Pre-molt	*	*	*	*
	Molt Interval	*	*	6-10	*
	% Molt During Interval	*	*	40-100	*
	Sector	*	*	3	*

Table 20 con't.

		MAY	JUNE	JULY	AUGUST
SF I.D.# 55	Pre-molt	*	28-30	1-?	*
	Molt Interval	*	*	?-18	*
	% Molt During Interval	*	*	40	*
	Sector	*	*	6	*
AF I.D# 72	Pre-molt	*	*	25-31	1
	Molt Interval	*	*	*	2-3
	% Molt During Interval	*	*	*	1
	Sector	*	*	*	6
SF I.D# 147	Pre-molt	*	*	*	*
	Molt Interval	11-19	*	*	*
	% Molt During Interval	1-75	*	*	*
	Sector	3	*	*	*

Only SF I.D.#147 had a molting history on Tern. AF I.D.#72 was 1% molted on Tern on 2 August 1983 but was not resighted on Tern until 23 August 1983 when she was 100% molted. This data suggests that there may be some intraatoll movement during molt. No known AM's molted during this study.

This information is only preliminary as the molting season is not completed.

Intraatoll Movements of Known Adult Females Prior to Pupping

There are 108 known adult females in the active files at FFS. During this study period 40 of these known AF's pupped (Table 21).

Table 21. Pupping History and Island Fidelity of Known Adult Females.

		1980	1981	1982	1983
AF#4	PUPPING DATE	1		July/ August[2]	Mid-July[3]
	ISLAND			East	East
AF#8	PUPPING DATE				10 May[4]
	ISLAND				East
AF#9[5]	PUPPING DATE	May	May-June	June	31 May
	ISLAND	East	East	East	East
AF#10	PUPPING DATE	Aug			
	ISLAND	East			
AF#11	PUPPING DATE				May
	ISLAND				W.S.
AF#14	PUPPING DATE			April	Mid-April
	ISLAND			East	East
AF#19	PUPPING DATE			Jun/July	
	ISLAND			East	
AF#29	PUPPING DATE				26 May
	ISLAND				East
AF#33	PUPPING DATE		May	June	
	ISLAND		East	East	
AF#46	PUPPING DATE		June		April
	ISLAND		East		East
AF#56	PUPPING DATE			June	4 June*
	ISLAND			East	East
AF#59	PUPPING DATE			July	7 July
	ISLAND			W.S.	W.S.
AF#60	PUPPING DATE			April/May	
	ISLAND			East	
AF#67	PUPPING DATE			June	June
	ISLAND			W.S.	W.S.
AF#70	PUPPING DATE		July	May	
	ISLAND		L. Gin	W.S.	
AF#72	PUPPING DATE		June	July	
	ISLAND		W.S.	W.S.	
AF#78	PUPPING DATE				June
	ISLAND				Mullet
AF#83	PUPPING DATE	Oct/Nov	Nov		
	ISLAND	East	East		

		1980	1981	1982	1983
AF#84	PUPPING DATE ISLAND				April Triglet
AF#87	PUPPING DATE ISLAND			May East	
AF#94	PUPPING DATE ISLAND		June W.S.		
AF#103	PUPPING DATE ISLAND				April* W.S.
AF#107	PUPPING DATE ISLAND			June Round	
AF#113	PUPPING DATE ISLAND		June(?) East		
AF#135	PUPPING DATE ISLAND			June W.S.	28 July-1 Aug. W.S.
AF#138	PUPPING DATE ISLAND			July East	
AF#149	PUPPING DATE ISLAND		May/June East	May/June East	2-8 July East
AF#150	PUPPING DATE ISLAND			June/July W.S.	9-17 July W.S.
AF#152	PUPPING DATE ISLAND			June/July W.S.	12 June East
AF#154	PUPPING DATE ISLAND		June East	June East	
AF#156	PUPPING DATE ISLAND			May East	
AF#169	PUPPING DATE ISLAND		June East	July East	
AF#171	PUPPING DATE ISLAND				6 June W.S.
AF#173	PUPPING DATE ISLAND		May East	May/June East	
AF#180	PUPPING DATE ISLAND				Early May East
AF#185	PUPPING DATE ISLAND			June/July East	16 Apr-26Apr. East
AF#190	PUPPING DATE ISLAND				May W.S.
AF#199	PUPPING DATE ISLAND			June/July W.S.	Late July W.S.

Table 21 cont.

	1980	1981	1982	1983
AF#202 PUPPING DATE ISLAND		June W.S.		
AF#203 PUPPING DATE ISLAND			June East	June East
AF#209 PUPPING DATE ISLAND		May East	May/June East	Mid-May East
AF#212 PUPPING DATE ISLAND	Apr/May East		May/June East	June East
AF#213 PUPPING DATE ISLAND			Aug. W.S.	Early Aug. W.S.
AF#216 PUPPING DATE ISLAND			July/Aug. East	
AF#218 PUPPING DATE ISLAND				June East
AF#220 PUPPING DATE ISLAND			May East	Late Apr. East
AF#221 PUPPING DATE ISLAND			May East	
AF#222 PUPPING DATE ISLAND			May/June East	
AF#223 PUPPING DATE ISLAND			Apr. East	4-10 May East
AF#224 PUPPING DATE ISLAND			May East	
AF#226 PUPPING DATE ISLAND			Sept. W.S.	
AF#227 PUPPING DATE ISLAND				31 May W.S.
AF#228 PUPPING DATE ISLAND				Mid-April Round
AF#229 PUPPING DATE ISLAND			May W.S.	
AF#231 PUPPING DATE ISLAND			Aug. East	
AF#232 PUPPING DATE ISLAND			May/June W.S.	June[6] W.S.
AF#233 PUPPING DATE ISLAND		May East	May/June East	
AF#234 PUPPING DATE ISLAND	Apr/May East	May East		

	1980	1981	1982	1983
AF#240 PUPPING DATE ISLAND			July East	
AF#243 PUPPING DATE ISLAND				May[7] Round
AF#255 PUPPING DATE ISLAND				April East
AF#257 PUPPING DATE ISLAND				April/May W.S.
AF#262 PUPPING DATE ISLAND				Early June East
AF#264 PUPPING DATE ISLAND				March East
AF#266 PUPPING DATE ISLAND				May East
AF#271 PUPPING DATE ISLAND				July East
AF#273 PUPPING DATE ISLAND			July W.S.	July W.S.

[1]blank space =no sightings only
[2]approximate pupping months
[3]month known but not exact pupping date
[4]Exact pupping date known
[5]pupped in 1976 on East
[6]not a confirmed sighting
[7]not a confirmed sighting
*stillborn

Twenty seven AF's were not sighted prior to pupping (Table 22).

Table 22. Adult Females Not Sighted Prior to Pupping.

I.D.#	Pupping Date	Island
8	10 May	East
11	May	WS
46	April	East
67	June	WS
78	June	MU
84	April	Triglet*
103	April	WS
171	6 June	WS
180	Early May	East
185	Mid-April	East

Table 22 con't.

I.D.#	Pupping Date	Island
190	May	WS
199	Late July	WS
203	June	East
209	Mid-May	East
212	June	East
218	June	East
220	Late-April	East
223	May	East
232	June	WS[1]
243	May	Round[2]
255	April	East
257	April-May	WS
262	Early June	East
264	March	East
266	May	East
271	July	East
273	July	East

* Trig is presently two islands
1 not a confirmed sighting
2 not a confirmed sighting

Eight AF's were sighted, on islets other than their pupping islets, from 6 weeks to two days prior to pupping (Table 23).

Table 23. Intraatoll Movements of Known AF's 6 wks-2 days Prior to Pupping.

I.D.#	Sighting Date	Island	Pupping Date	Island
9	29 May	Tern	31 May	East
14	23 March	Tern	Late-April	East
29	1 May	Tern	26 May	East
56	28 May	WS	4 June	East
150	16 June	Tern	9-17 July	WS
152	9 June	WS	12 June	East
228	9 April	WS	Mid-April	Round
262	23 April	Dis.	Early June	East

Six AF's were sighted, on their pupping islets, 3 to 8 days prior to pupping, but it is not known whether they remained on these islets for the entire interim until pupping (Table 24).

Table 24. Known AF's Sighted on Their Pupping Islet 3-8 Days Prior to Pupping.

I.D.#	Sighting Date	Islet	Pupping Date	Islet
4	17 July	East	17-25 July	East
59	4 June	WS	7 July	WS
135	28 July	WS	28 July-1 Aug.	WS
149	30 June	East	2-8 July	East
213	4 Aug.	WS	Early Aug.	WS

AF I.D.#9 was sighted on 29 May on Tern and pupped on 31 May 1983 on East, a distance of 6.5 miles. AF I.D.#9 pupped on East in 1976, 1980, 1981, 1982, and 1983. There is no data for the intervening years. This example suggests that she exhibited a traditional pupping ground fidelity and was not likely to pup on Tern. Except for AF's I.D.#'s 152 and 70, known AF's who have pupped appear to be very islet specific.

AF I.D.#152 was sighted on 9 June 1983 on Whale-Skate and pupped on 12 June 1983 on East, a distance of 3 miles. In 1982, she pupped on Whale-Skate. AF I.D.#70 is the only other known seal, with a pupping history, who pupped in two consecutive years on different islets. In 1982, she pupped on Little Gin which does not appear to be a popular pupping islet but in 1983 she pupped on Whale-Skate, a popular pupping islet.

The intraatoll movement of AF's I.D.#9 and 152 indicated that pregnant AF's are capable of traveling some distance prior to pupping.

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